IN THE SPECIFICATION:

Please replace paragraph number **[0003]** with the following rewritten paragraph:

[0003] State of the Art: During the manufacture of semiconductor devices, a ~~semi-~~semiconductor device or chip is often attached to a support, such as a lead frame. In general, a "leads-over-die" or "lead-on-chip" semiconductor device assembly has a lead frame with lead fingers that extend over the active surface of the semiconductor device supporting the semiconductor device being electrically connected to the bond pads located thereon, typically by wire bonds extending between the bond pads and the ends of the lead fingers, the other ends of the lead fingers for attachment to other circuit components. The lead fingers extend inwardly on the lead frame to bond pads located on the active surface of the semiconductor device for connection thereto as described in United States Patent 4,862,245 (Pashby, et al.) and United States Patent 5,304,842 (Farnworth, et al.).

Please replace paragraph number **[0007]** with the following rewritten paragraph:

[0007] The system also includes a source of semiconductor devices to supply semiconductor devices in a semiconductor device-by-semiconductor device sequence. Attaching means are positioned relative to the source of semiconductor devices to obtain each semiconductor device ~~of the plurality of semiconductor devices~~ in the semiconductor device-by-semiconductor device sequence. The attaching means is also positioned to receive the lead frames with the curable adhesive applied thereto in lead frame-by-lead frame sequence from the application means. The attaching means is also configured to attach one of the semiconductor devices to a corresponding lead frame of the plurality of lead frames in lead frame-by-lead frame sequence by urging the device into contact with the curable adhesive of each lead frame of the plurality of lead frames and holding each of the semiconductor devices in contact with the curable adhesive for a preselected period. That is, at least one semiconductor device is attached to each lead frame. Of course, in some applications, multiple devices may be attached to a particular lead frame configured to receive multiple semiconductor devices.

Control means are provided in the system to supply operation signals to operate the various components thereof.

Please replace paragraph number **[0008]** with the following rewritten paragraph:

[0008] The attaching means preferably includes press means for pressing each semiconductor device ~~of the plurality of semiconductor devices~~ into contact with a curable adhesive. The attaching means also preferably includes transfer means for transferring each semiconductor device ~~of the plurality of semiconductor devices~~ in semiconductor device-by-semiconductor device sequence from the source of semiconductor devices to the press means.

Please replace paragraph number **[0009]** with the following rewritten paragraph:

[0009] The press means desirably includes heating means to heat the semiconductor device before it is pressed against the curable adhesive. The heating means is desirably a block positioned to receive each semiconductor device ~~of a plurality of semiconductor devices~~ from the transfer means. The press means most preferably includes a press mechanism to move the block from a receiving position to receive thereon a semiconductor device ~~of the plurality of semiconductor devices~~ into an attached position in which the block with a semiconductor device of the plurality of semiconductor devices is urged into contact with the curable adhesive. The heating means desirably heats the block to a temperature from about 200°C. to about 225°C.

Please replace paragraph number **[0012]** with the following rewritten paragraph:

[0012] In alternate configurations, the lead frames of the plurality of lead frames are connected one to another. The lead frames preferably have at least ~~one~~ one, and ~~preferable two~~ preferably, two removable edges or rails, with drive perforations formed therein. Indexing means includes an electrical device connected to a drive structure which is configured to engage the perforations formed in each lead frame.

Please replace paragraph number **[0014]** with the following rewritten paragraph:

[0014] A method for applying curable adhesive to each lead frame of a plurality of lead frames and attaching a semiconductor device to each ~~such~~ lead frame includes providing a system and operating the system to supply semiconductor devices and lead frames relative to application means and attaching means. The system is also operated to apply adhesive to a semiconductor device site of each lead frame and to then attach a semiconductor device to the adhesive at the semiconductor device site. Preferably, the adhesive is a snap curable epoxy with a cure time of about ~~1~~ one (1) second. Even more preferably, the application means includes a pressing structure which includes a block that heats the semiconductor devices to a temperature from about ~~200 degrees centigrade~~ 200°C. to about ~~225 degrees centigrade.~~ 225°C.

Please replace paragraph number **[0028]** with the following rewritten paragraph:

[0028] The system 10 includes indexing means for supplying and advancing a plurality of lead frames for semiconductor devices in a lead frame-by-lead frame sequence. More specifically, the lead frames 12 are supplied from a source 14 and are urged or moved relative to the other structures of the ~~system~~ system 10 by a driver 16, which is constructed to drivingly engage and move the plurality of lead frames in lead frame-by-lead frame sequence, all as more fully discussed hereinafter.

Please replace paragraph number **[0030]** with the following rewritten paragraph:

[0030] The application means 32 is configured to receive the plurality of lead frames 12 in lead frame-by-lead frame sequence. The application means 32 is connected to the source of curable adhesive 18 to receive curable ~~adhesive~~ adhesive 18 therefrom through the delivery conduit 30. The application means 32 is configured and operable to apply the metered amount of curable ~~adhesive~~ adhesive 18 in a preselected pattern to the application surface 36 opposite a second surface 34 of each lead frame of the plurality of lead frames 12 (FIG. 10). As depicted in FIG. 1, the application means 32 includes an applicator 38 which is ~~here~~ operated in an up and down or in and out direction 40 by a rod 42 connected to a piston 44 positioned in a cylinder 46.

The piston 44 is ~~here~~ shown to be fluid driven and may be operated by gas or liquid. However, a gas is preferable because of faster response times, and air is preferable because of low cost.

Please replace paragraph number **[0031]** with the following rewritten paragraph:

[0031] As illustrated in drawing FIG. 1, air under pressure is received from a reservoir 48 via a first supply line 50 through a first air solenoid 52 and a connector 54 to the cylinder 46. A second air solenoid 56 is connected to receive air under pressure via a second supply line 58. The second air solenoid 56 is connected by a connector 60 to the cylinder 46. In operation, air under pressure is supplied to the reservoir 48, for example, by an on-demand air pump 62. That is, the air pump 62 may operate under the control of the controller 28 or upon detection of a pressure signal indicating a need to increase the pressure in the ~~reservoir.~~ reservoir 48. To operate the applicator 38, the air solenoids 52 and 56 are operated by operation signals received from the controller 28 via conductors 64 and 66 so that air under pressure is supplied to the underside 68 of the piston 44 in order to urge the applicator 38 upward 40 toward one of the plurality of lead frames 12. As air under pressure is being supplied to the underside 68 of the piston 44, the air solenoid 56 is positioned to vent air from the top 70 of piston 44 to the atmosphere from the vent 71. When it is desired to have the applicator 38 move away from the plurality of lead frames 12, the air solenoid 52 is positioned to a venting position in order to vent air through vent 72. At the same time, air under pressure may be directed through the air solenoid 56 via the second supply line 58 and the connector 60 to the top 70 of the piston 44 in order to urge it in a downward ~~direction.~~ direction 40. As so configured, it can be seen that the piston 44 and, in turn, the applicator 38 may be positioned precisely as desired based on the operation signals received from the controller 28 in order to effect a transfer of adhesive supplied via the delivery conduit 30 to the applicator 38 upon coordinated operation of the solenoid 24.

Please replace paragraph number **[0038]** with the following rewritten paragraph:

[0038] In operation, the transfer means 88 can be moved upwardly and downwardly or inwardly and outwardly 126 by operation of the stepping motor 122. In turn, the arm 90 and the pickup 98 can be moved into close proximity or contact with each semiconductor device of the plurality of semiconductor devices 78. When in virtual contact, appropriate vacuum can be applied by operation of the solenoid 102 so that the semiconductor devices ~~79~~ 78 under the pickup 98 may be picked up and raised upon operation of the stepping motor 122. When raised upwardly 126 an appropriate distance 128, the housing 92 may be rotated by operation of the stepper motor 94 through gear 96 and recesses of gear elements 97. ~~Thus~~Thus, each semiconductor device of the plurality of semiconductor devices 78 may be transferred from the source of semiconductor devices 74 to the block 110.

Please replace paragraph number **[0039]** with the following rewritten paragraph:

[0039] It may be recognized that the transfer means 88 herein described is simply illustrative of structure to effect the transfer of each semiconductor device of the plurality of semiconductor devices 78 to the block 110. A variety of chutes, slides and similar mechanisms may be devised to effect the positioning of each semiconductor device of the ~~plurality~~ plurality of semiconductor device 78 in a sequential fashion onto block 110.

Please replace paragraph number **[0041]** with the following rewritten paragraph:

[0041] The press mechanism illustrated in drawing FIG. 1 is a hydraulically operated cylinder 134. The hydraulic fluid in the illustrated arrangement of drawing FIG. 1 may be air supplied from a reservoir 136 through a raised solenoid 138 and a lower solenoid 140. That is, air pressure may be created in the reservoir 136 by operation of an air pump 144. The air pressure may be supplied via supply lines 146 and 148 to their respective solenoids 138 and 140. The solenoids 138 and 140 may be operated in sequence to place air pressure underneath the piston 135. Air under pressure under the piston 135 urges the piston 135 upwardly or inwardly while solenoid 140 is operated to vent the air above the piston 135 through a vent line 150 to the

atmosphere. Similarly, when the block 110 is to be lowered, the solenoid 140 is operated to provide air pressure to the top part of the piston 135 to urge it downward while the raised solenoid 138 is operated to vent the air thereunder through vent line 152. The solenoids ~~140~~ 138 and ~~138~~ 140 are connected by conductors 154 and 156, respectively, to the controller 28 to receive operation signals therefrom in order to effect movement of the piston 135 and, in turn, the block 110. Of course, the air pressure is maintained by appropriate operation of the air pump 144 by receipt of operation signals via conductor 158 from the controller 28 or from a pressure sensor as desired. The solenoids ~~140~~ 138 and ~~138~~ 140 may be replaced with a three-way solenoid or by other mechanisms to port air or other hydraulic fluid.

Please replace paragraph number **[0042]** with the following rewritten paragraph:

[0042] The block 110 is here shown with a spring wound electrical conductor 160 extending away therefrom. The conductor 160 is spring wound so that the block 110 may easily move upward and downward as described. The spring wound conductor 160 is connected to a source of electrical power and to a heater 111 (FIG. 9), positioned in the block 110, so that the ~~block~~ block 110 may be heated to a desired temperature. In turn, a semiconductor device, such as semiconductor device 130, is heated in the process of moving it and holding it in place against the curable adhesive 132 to a desired temperature in order to effect the curing of the curable adhesive 132 as the semiconductor device 130 comes into contact therewith.

Please replace paragraph number **[0043]** with the following rewritten paragraph:

[0043] The applicator 38 of the application means 32 is illustrated in more detail in drawing FIGS. 2 and 3. It receives adhesive from the delivery conduit 30 under pressure from the reservoir 20. That is, the adhesive is urged into a distribution chamber 162 so that it may be urged out through a plurality of apertures such as aperture 164. The top 166 of the applicator 38 has a plurality of apertures, such as aperture 164, formed therein in a desired pattern. For example, the applicator 38 has an illustrated pattern of apertures 165 which is desired in order to receive and hold a particular device in contact with the bumps or connector pads of a lead frame

containing electrical leads in a desired pattern. The pattern of apertures 165 may be of different sizes and dimensions, as well as in different geographic configuration, all to effect the desired application of adhesive.

Please replace paragraph number **[0044]** with the following rewritten paragraph:

[0044] In operation, the applicator 38 will be brought into very close proximity to the application surface 36 of a particular lead frame of the plurality of lead frames 12 being indexed by driver 16. Adhesive is urged through the delivery conduit 30 to the distribution chamber 162. Adhesive is thereupon urged outward through the pattern of apertures 165 to contact and adhere to the application surface 36 of each lead frame of the plurality of lead frames 12. As each lead frame of the plurality of lead frames is indexed past the applicator 38, the applicator 38 is first retracted and then positioned upward to cause the adhesive to contact the surface of the lead frame and position the adhesive thereon in the desired pattern.

Please replace paragraph number **[0045]** with the following rewritten paragraph:

[0045] In drawing FIG. 1, there is illustrated a substantial distance between the application ~~means~~ means 32 and the attaching ~~means.~~ means 86. That is, time to cure could be provided by providing an appropriate or desired distance ~~268~~ 168 between the application means 32 and the attaching means 86. The delay, in turn, can provide time for the adhesive to begin to set up or start its curing process.

Please replace paragraph number **[0046]** with the following rewritten paragraph:

[0046] Referring to drawing FIGS. 4 and 5, an alternate arrangement of a plurality of lead frames is illustrated in which a plurality of nozzles including nozzles 178, 186 and 188 is shown positioned to apply adhesive to the application surface 171 of lead frames 172, 174 and 176. Thus, it can be seen that the nozzles 178, 186, ~~188~~ and 188 may provide a desired pattern of adhesive 190, 192 and 194 as illustrated in drawing FIG. 5. Each nozzle 178, 186

and 188 is connected to the common delivery conduit 30 for further connection through the solenoid 24 to the reservoir 20 of curable adhesive.

Please replace paragraph number **[0047]** with the following rewritten paragraph:

[0047] Referring back to drawing FIG. 2, it can been seen that the applicator 38 is, in effect, a type of printing mechanism, a portion of which applies adhesive to the underside or to one surface of each lead frame of a plurality of lead frames. In lieu of patterned apertures, such as that illustrated in drawing FIGS. 2 and 3, a silk screen structure may be provided over the distribution chamber 162 so that the adhesive may pass ~~there~~ therethrough in a desired pattern provided in the silkscreen surface.

Please replace paragraph number **[0048]** with the following rewritten paragraph:

[0048] In drawing FIGS. 6 and 7, a roller mechanism is illustrated. More specifically, a plurality of lead frames 196 is shown passing relative to a roller 200. The roller 200 is driven by a stepping motor, split phase motor or the like, 202 which is connected by a conductor 204 to the controller 28 to receive operation signals therefrom. The roller 200 is positioned in a container 206 which has there within a quantity of curable adhesive 208. As the ~~roller~~ roller 200 rotates 210 through the adhesive 208, it picks up adhesive on desired adhesive application surfaces. More specifically, as can be better seen in drawing FIG. 7, raised surfaces 212 and 214 are provided. A wiper 216 is positioned in close proximity to the roller 200 in order to wipe all excessive adhesive therefrom and return it to the container 206. As seen in drawing FIG. 7, the wiper 216 has a first notch 218 and a second notch 220 to register with the raised surfaces 212 and 214, respectively. The notches 218 and 220 are inset a distance 222 so that the appropriate metered amount of adhesive will remain on the surfaces 212 and 214. In turn, as the roller 200 ~~rotates~~ rotates 210 into contact with a lead frame of a plurality of lead frames 196, adhesive on the surfaces 212 and 214 is deposited on each lead frame of the plurality of lead frames in a desired pattern. That is, the adhesive is applied at a desired site on the desired surfaces of each lead frame. A plurality of spaced apart surfaces, such as surfaces 212 and 214, may be

positioned around the perimeter of the roller 200 based on the dimensions of the lead frame and the diameter of the roller 200.

Please replace paragraph number **[0050]** with the following rewritten paragraph:

[0050] As hereinbefore discussed, each semiconductor device of the plurality of semiconductor devices 78 is to be transferred from the source of semiconductor devices 74 to the block 110. The pickup 98 in drawing FIG. 1 is better illustrated in drawing FIG. 8. The pickup surface 230 is here shown to be a flexible surface with a plurality of small holes 232. The pickup surface 230 may be better described as a porous surface through which air may readily be drawn. ~~Thus~~Thus, the creation of a vacuum in the chamber 234 is transmitted ~~to external~~ external to the pickup surface 230 wherein suction upon contact with a semiconductor device of the plurality of semiconductor devices 78 is sufficient to hold the semiconductor device against the pickup surface 230. Such semiconductor device may then be retained against the pickup surface 230 and lifted and transferred from the conveyor 76 to the block 110. As can be seen, the vacuum is effected through an internal channel 236 formed in the extension 238 which is connected to the pickup 98.

Please replace paragraph number **[0051]** with the following rewritten paragraph:

[0051] Turning now to drawing FIG. 10, it can be seen that a plurality of lead frames 12, illustrated in drawing FIG. 1, is here shown consisting of lead frames 240, 242, 244 and 246. Each of the lead frames 240, 242, 244 and 246 has a plurality of lead fingers such as lead finger 248. Each lead frame 240, 242, 244 and 246 is secured with the others by at least ~~one~~ one, and preferably ~~two~~ two, outside edges or rails, 250 and 252 formed with perforations 254 to mesh with drive teeth 256 and 258 associated with driver 16. The driver 16 is driven via axle 260 by a driver motor 266 which is connected by conductors 268 and 270 to the controller 28 in order to cause the plurality of lead frames 12 to index or to move relative to the application means 32 and the attaching means 86 as desired. As here shown, the driver 16 has an internal recessed portion 272 which allows the lead frames with a respective device or devices or

semiconductor chips 274, 276 and 278 attached thereto to pass there over for further processing in which the lead frames are separated one from the other and wherein the outside edges 252 and 250 are separated therefrom.

Please replace paragraph number **[0053]** with the following rewritten paragraph:

[0053] The control means sends the necessary operation signals in order to cause adhesive to process through the solenoid 24 and the delivery conduit 30 to the applicator 38. The applicator 38 is moved up toward and away from the appropriate lead frames in order to apply a pattern of adhesive to one surface, more particularly, the application surface 36 of each lead frame of a plurality of lead frames in a lead frame-by-lead frame sequence. Semiconductor devices such as semiconductor device 78 are supplied by a source and transferred by attaching means which includes a transfer structure to a press mechanism. That is, the semiconductor devices, such as semiconductor device 79, are transferred to the press mechanism which, in turn, urges each semiconductor device in semiconductor device-by-semiconductor device sequence to and in contact with the patterned adhesive.

Please replace paragraph number **[0054]** with the following rewritten paragraph:

[0054] It should be noted that the preferred adhesive is a snap cure adhesive available from Quantum Materials, Inc. of San Diego, California. A preferred adhesive has been determined to be a snap cure epoxy which is known as the 505 epoxy formula. The desired snap cure epoxy is preferably defined to have a cure time of substantially less than one minute and preferably less than one second when it is applied with a block 110 that is preferably at a temperature between ~~200°~~ 200°C. and 225°C. That is, the block 110 is heated via conductor 160 to expedite the curing when the semiconductor devices are being attached to the attaching surface of each of the plurality of lead frames.

Please replace paragraph number **[0055]** with the following rewritten paragraph:

[0055] The snap cure epoxy and, more particularly, the 505 epoxy ~~is~~ are preferred in metered amounts of about 1 milligram for every device site or for every device that is being applied to the lead frame. In some applications, multiple devices may be applied. In others, a single device may be applied.

Please replace paragraph number **[0056]** with the following rewritten paragraph:

[0056] In preferred arrangements, the epoxy applied preferably contains a non-conductive filler which may be made of ~~Teflon®.~~ Teflon®, Teflon® granular material or flakes ~~may~~ and may be mixed into the adhesive in order to function as a filler to achieve the desired tackiness and cure time.